In life, certain adults (sex not recorded) had an orange wash on the posterior throat and a salmon wash on the lateral parts of the belly. The tongue and lining of the mouth was pale pink in colour.

Specimens examined. Australian Museum R 9541: Finck River, 80 mls S Alice Springs, N.T.; R 26413-14: Ayers Rock, N.T.; R 59925: Maryvale, N.T.; R 81296: ca 65 km S of Exmouth, W.A.; R 81404-06; 50±20 km S of Exmouth, W.A.; R 86509-12, 107497: 2.5 km SE of Condun Well, W.A.; R 101596: just W of Bullara homestead, W.A.; R 101634-35: ca 64 km S of Exmouth, W.A.; R 118510-11, 121004: 8/9 km S of Exmouth by Road, W.A.

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THE BROODING SPIDER CRAB *PARANAXIA SERPULIFERA* (GUÉRIN) FROM COCKBURN SOUND, WESTERN AUSTRALIA

By GARY J. MORGAN, Western Australian Museum, Francis Street, Perth 6000.

INTRODUCTION

Most decapod crustaceans, and virtually all true (brachyuran) crabs, display metamorphic (several stages) development (Barnes 1974: 606; Williamson 1982: 47). With few exceptions, brachyuran eggs hatch as planktonic zoea larvae, passing through several (usually three to six) stages before transforming into post-larvae, or megalopas. The megalopa larvae develop into juvenile crabs.

In most crabs, the male transfers sperm via modified pleopods (swimmerets) to seminal receptacles in the female during mating. The female lays the internally fertilised eggs sometime later and attaches them to setae on her pleopods. The eggs are carried in a mass between the abdomen and thorax for varying periods of time until hatching when the zoea are released.

Crabs of the family Majidae, commonly known as spider crabs, are widespread in intertidal, shallow subtidal and deep offshore waters around Australia. Many members of this family characteristically

decorate their exoskeleton with algae, sponges, bryozoans and other encrusting organisms and hence are also known as decorator or seaweed crabs. The decorating behaviour has been documented for some species (Wicksten 1980). Almost all majids display the usual metamorphic pattern of development (Williamson 1982).

One Australian majid however appears to be unique in showing direct development in which the zoea and megalopa stages are omitted. *Paranaxia serpulifera* (Guérin) is a large majid (Figure 1) occurring along the coast of Western Australia from the vicinity of Perth north and east to northern Queensland. The species has been recorded from shallow reefs to depths of approximately 30 m. Rathbun (1914) noted a specimen of this species from the Monte Bello Islands west of Dampier carrying juveniles in a brooding chamber beneath the body. Since that date, there has been no further record of this brooding behaviour.

Figure 1. *Paranaxia serpulifera,* female, dorsal view.

NEW RECORD OF BROODING

In late January 1986, two females of *P. serpulifera,* one recently dead, the other alive in seawater, were brought to me for

examination. Both had been collected in crab tangle nets in Cockburn Sound at depths of approximately 15 m, and each carried more than 150 juveniles in their large brood chambers (Figure 2). The live specimen was maintained in an aquarium for several days during which time juveniles left the brood chamber to move over the body and legs of the female. Young were observed to feed on particles, possibly attached algae, on the mother's cuticle.

Females of this species are well adapted for brooding young. The abdomen is broad and convex and the roof of the brood chamber domed, providing a large space for juveniles. This contrasts with the narrow abdomen of the male (Figure 3). Reports from local fishermen indicate that the species carries red or orange eggs in December and January, with hatching in January and February. It is not known how long the juveniles are carried by the mother, both in the brood chamber and later on her exoskeleton.

Figure 2. *Paranaxia serpulifera*, female, ventral view showing juveniles in brood chamber.

DISCUSSION

Direct development is characteristic of many freshwater crustaceans, an adaptation to reduce undesirable downstream drift of larvae. Such development is typified by the freshwater crayfish and freshwater crabs of the superfamily Potamoidea.

In marine brachyura, only a few cases of direct development are known and all of these examples are found in Australian and New Zealand waters (Wear 1967; Lucas 1980). The advantages of retaining young with the mother are that early mortality of planktonic larvae, especially by predation, is obviated and the juveniles when leaving the parent are probably dispersing into a suitable habitat for survival and growth.

As our knowledge of life histories of crabs improves, further examples of brooding of young will almost certainly become apparent. At present, however, *Paranaxia serpulifera* is the only majid in the world and the only marine crab in Western Australia known to develop directly and brood young.

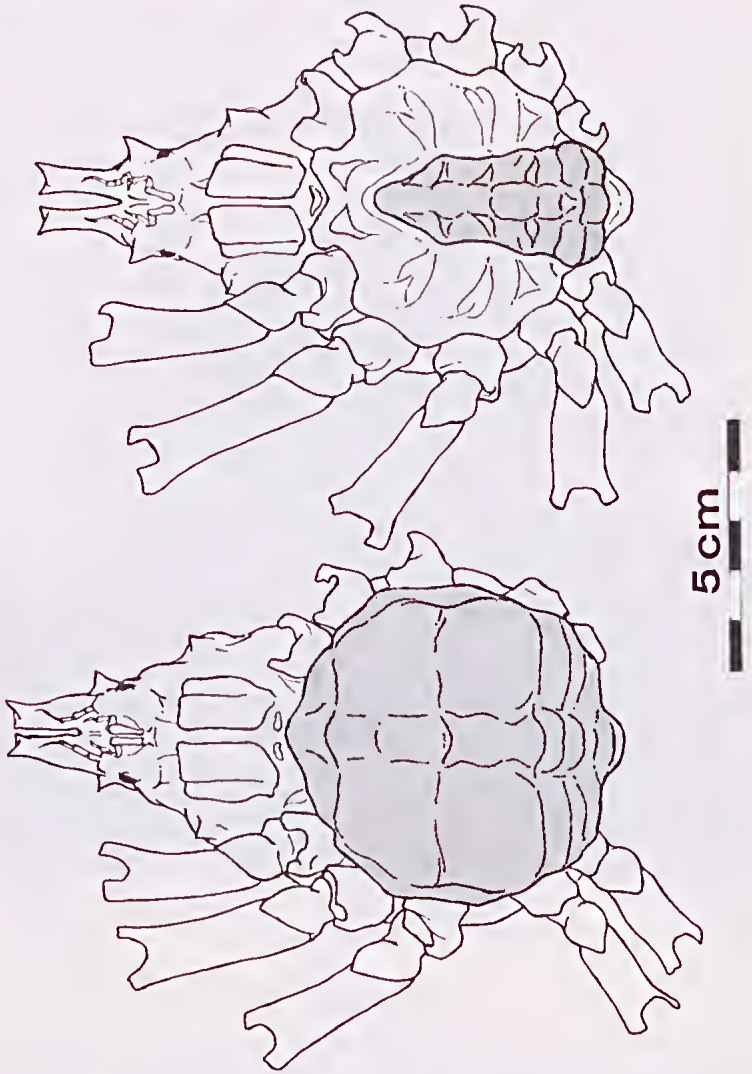

Figure 3. *Paranaxia serpulifera*, ventral view of female (left) and male, abdomen stippled.

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HERPETOFAUNA OF GARDEN ISLAND

By DAVID ROBINSON, Duncraig, W.A. 6023,
BRADFORD MARYAN, Lynwood, W.A. 6155 and
ROBERT BROWNE-COOPER, Shenton Park, W.A. 6008

INTRODUCTION

Little information is available on the herpetofauna of Garden Island. From July 1984 to February 1985, we visited the island on five weekend visits during which specimens were collected, identified and information was recorded on their habitat, distribution and relative abundance. Voucher specimens have been lodged at the W.A. Museum.

Garden Island extends between Latitude 32°09' and 32°14' and between Longitude 115°40' and 115°41' and is located 8 km north-west of Rockingham. It has a total land area of *ca* 1200 ha. The Australian Navy occupies *ca* 20% of the island, the remainder is managed by the Department of Conservation and Land Management as a National Park.

McArthur and Bartle (1981) recognised fifteen different vegetation communities; the dominant one is *Acacia rostellifera* scrub which covers more than half the island. *Callitris preissii Melaleuca lanceolata* forest dominates the northern end. In addition, some of the sub-dominant vegetation communites are: *A. rostellifera/ M. lanceolata* scrub, littoral vegetation and cliff-top vegetation extending mainly along the western coastline. Collecting methods involved raking through leaf-litter and other surface debris, turning over rocks, logs and rubbish, spotlighting, head torching and the use of pit-fall traps with drift fences.